

Spherically symmetric static space-times and their classification by Ricci inheritance symmetries^(*)

A. H. BOKHARI^{(1)(**)}, A. R. KASHIF⁽²⁾ and A. H. KARA⁽³⁾

⁽¹⁾ *Department of Mathematical Sciences, King Fahd University of Petroleum and Minerals
Dhahran 31261, Saudi Arabia*

⁽²⁾ *Department of Mathematics, National University of Sciences and Technology
Rawalpindi, Pakistan*

⁽³⁾ *Department of Mathematics, Wits. University
Centre for Differential Equations, Continuum Mechanics and Applications
P. Bag 3, Wits 2050, Johannesburg, South Africa*

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Summary. — Ricci inheritance symmetry defines the symmetry directions for the Ricci tensor, as homotheties and conformal Killing vectors are for the metric tensor. Whereas a complete classification of metrics possessing some minimal symmetry groups exists in the literature for the last two symmetries, no complete listing of space-times metrics and their Ricci inheritance symmetry has been given so far. In this paper we discuss this issue by giving a complete classification of spherically symmetric static space-times by their Ricci inheritance symmetries.

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1. – Introduction

In General Relativity (GR) there exists a wide body of literature on classification of space-times starting from the very fundamental symmetry, usually known as Killing Vector (KV), to the most physical symmetries that are given by Ricci (RC) and Curvature (CC) Collineations [1-13]. Whereas the KVs provide information about the symmetries of the underlying space-times, the RCs and the CCs, respectively, relate to symmetries of the matter energy field and the Riemann curvature tensor [1-4]. More recently, some work has appeared on Ricci inheritance (RI) symmetry giving a discussion on how this symmetry can relate to conformal Killing vectors (CKV) [14, 15]. This proposed relationship of

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^(**) On leave from Department of Mathematics, Quaid-i-Azam University, Islamabad, Pakistan.
E-mail: abokhari@kfupm.edu.sa; abokhari@fulbrightweb.org